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Volume 22 | Issue 3 Article 7

1960

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Recommended Citation
Baker, Durwood L. (1960) "Dental Calculus," *Iowa State University Veterinarian*: Vol. 22 : Iss. 3 , Article 7.
Available at: https://lib.dr.iastate.edu/iowastate_veterinarian/vol22/iss3/7

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Dental Calculus

Durwood L. Baker, D.V.M.

A THOROUGH examination of the mouth is an important part of the general physical examination of the dog. Oftentimes localized disease processes are observed, and frequently symptoms or lesions of more generalized disease conditions are detected in this procedure. It is to the advantage of the patient, client and veterinarian that examination of the oral cavity be a part of every physical examination.

The presence of dental calculus is the most frequent of the several commonly noted dental abnormalities in the dog. The etiology, removal, and prevention of dental calculus are discussed in the following paragraphs.

Dental calulus or tartar is of two types — salivary and serumal. Salivary calculus is the most frequently encountered in the dog. This calculus originates with the saliva. Its occurrence is favored by the action of urea converting bacteria in the mouth, the evaporation of the water fraction of the saliva especially during panting, and a lack of proper cleaning of the teeth. Calcium carbonate and tricalcium phosphate are carried via the saliva to the oral cavity where in some mouths due to a slight increase in the pH of the saliva and to the formation of the agglutinin of the calculus, these salts precipitate and are deposited on the surfaces of the teeth. Initially this soft white calculus changes into two components — a clear substance that soon softens, breaks-up, and disappears, and, a more dense white substance that increases in density and as it does so adheres to the dental enamel. The calculus is somewhat porous, and as a consequence food particles become embedded in the calculus. Decomposition of these food particles occurs quite rapidly. In many instances color changes occur simultaneously with putrefaction, and the calculus becomes stained. The color of the stained calculus varies considerably from that of a chalky cream-white to a rather intense brown with various hues of tan and black interposed. Salivary calculus formation occurs on the teeth only, however, the gingivae and gums are damaged by irritation and pressure from the accumulated calculus and eventually by infection. The supporting structures of the tooth may be damaged and ultimately one or more teeth may be lost. The calculus is noted most frequently on the buccal surface of the carnassials and the molars and on the labial surface of the canine teeth of the upper arcade. In the lower jaw the labial surfaces of the canine teeth are most frequently involved. The largest deposits of calculus on the lingual surfaces are usually seen on the canines, both upper and lower. In neglected mouths salivary calculus may be noted on all surfaces of all teeth. The greatest collection of calculus is always located on that portion of the enamel nearest the gingivae and gums. The continued accumulation of calculus imposes upon these soft tissues

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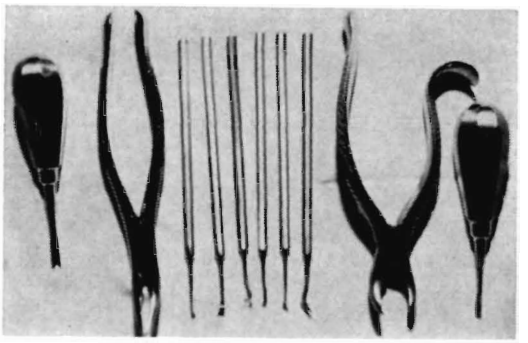
thereby causing them to become irritated and thickened and eventually causing their (gum) recession. These inflamed tissues are subject to attack by ever present bacterial organisms. If such attack occurs suppuration follows, pericementitis occurs, and eventually detachment of the peridental membrane may occur with loss of the affected tooth or extraction of the affected tooth becoming necessary.

Serumal calculus originates within the irritated gingiva. Calcoglobulin is formed in consequence of serum liberation by the affected gingivae. This material is changed and broken down by chemical activity with a resultant deposit of a black colored calculus beneath the gingiva margin. This further irritates the gingivae, stimulating it to further liberation of serum, increased serumal calculus formation, suppuration, and eventual detachment of the peridental membrane.

The impaction of food and hair or other debris between the encrusted teeth or adjacent to the exposed peridental membrane may also aggravate the situation. The presence of suppurative processes any place in the body, but especially in the peridental membrane area, gives rise to many opportunities for the spread of infective organisms to other parts of the body. The periodic removal of calculus is indicated as a prophylactic measure in an attempt to guard against the unnecessary loss of teeth and/or the establishment of local or generalized disease processes.

Many of the canine patients in need of dental care are several years of age. Likewise many of these patients have co-existing disease conditions. An evaluation of cardiac, hepatic, and renal function is an important part of the preoperative examination of any aging patient. A hemogram and in some instances a determination of the clotting time will also be found useful as indices of body functions. Certainly then many of these patients will benefit from preoperative medication for coexisting conditions, the preoperative administration of broad spectrum antibiotics, and the preoperative administration of supportive drugs such as the corticosteroids.



Dental Instruments.

Any dental surgery should be scheduled for such time as is convenient to the operator. Adequate time should be allotted for meticulous cleaning of the teeth and the performance of any other dental surgery such as extraction as may be indicated.

Scaling or tartar removal is a relatively simple procedure. There are, however, a few basic premises to be considered. The selection of clean instruments of good quality is mandatory. A hoe type scaler with the scaling edge at right angles to the shaft or handle will serve as both a pull and push type instrument. Some veterinarians find it advantageous to use instruments with slightly beveled edges in order to insure better "cutting" action. In these instances separate push and pull scalers should be selected. A cleoid (claw) shaped scaler is also necessary. It will serve as both a scaler and as an exploring or probing instrument. These instruments are in most cases all that are necessary for the removal of the salivary calculus. One may, of course, find it desirable to include in his armamentorium several of the many types of scalers available. It is well to include an incisor and/or molar forceps, an elevator, a bulb syringe, a few cotton tipped applicators, a few cotton gauze sponges, a mouth gag, and a wound retractor in the instrument set-up. By so doing, one is properly equipped to cope with the more common occurring dental conditions that may be evident at the time of calculus removal, e.g., loosened teeth requiring extraction.

The patient should be restrained or as temperament may dictate sedated or anesthetized. The choice of an anesthetic agent or a combination of agents is an

important decision. While the use of a tranquilizer and a topical anesthetic may be found satisfactory and perhaps advantageous in some instances, the ultra-short acting barbiturates are as a rule well tolerated and most satisfactory for dental procedures. The duration of anesthesia is adequate, and recovery there from is usually quite rapid, the entire process most usually consuming less than one hour. The restrained or sedated animal may be treated while he is in either a standing, sitting, or laterial recumbent position. The anesthetized animal should be placed in lateral recumbency with the head tilted slightly downward to facilitate free drainage of the oral cavity. The use of a mouth gag is elective. Posterior retraction of the lip commissure with a blunt type wound retractor facilitates exposure and cleaning of the molar teeth.

The expedient removal of calculus involves practice, skill, and patience. The scaler edge should be placed at the gingival margin in such a fashion as to nudge the gum gently and allow one to establish contract with the enamel at the gingival edge of the calculus mass. The scaler is then pulled or pushed as the case may be toward the occlusal surface of the tooth. The pressure on the scaler should be adequate to dislodge the calculus but restrained so as to prevent injury to the nearby gum tissue in case of sudden breaking away of the calculus. If the calculus mass is thick, it is expedient to crack the mass by "squeezing" it with the dental forceps. The exposed contact and labial surfaces of the teeth, both upper and lower, closest to the operator are usually cleaned first starting with the last molar and progressing anteriorly to the central incisor. It is best to initiate the removal at the posterior contact surface of the tooth and proceed systematically to the anterior contact surface. This assures most complete removal of the calculus. Next, the exposed contact and lingual surfaces of the teeth on the opposite side of the mouth are cleaned with the dog in this same position. The patient is then rotated and the calculus removed from the remaining exposed surfaces of the teeth.

The mouth is then flushed with water or saline and the teeth inspected. Any remaining calculus is then removed. It is usually difficult to establish the presence of thin layers of the non-stained salivary calculus. Tincture of iodine may be sparingly applied with a tipped applicator to effect a staining of the remaining calculus and may also aid in loosening the calculus. Meticulous removal of all the calculus is desired for any remaining calculus favors the deposition of more tartar.

Brushing the teeth with electrically powered equipment is indicated at this point in this procedure. Coarse pumice on a wet brush serves well for this brushing. Subsequently, polishing can be effected in a similar manner with prophylactic paste in a rubber polishing cup. Care should be exercised in the use of power equipment to prevent the creation of excess heat that may damage the teeth or gums. The mouth should be thoroughly rinsed upon completion of the cleaning procedure.

Postoperative treatment is limited to supportive measures except in those cases in which other dental surgery such as extractions have been exercised at the time of calculus removal. Dietary adjustments and the administration of vitamins and/or endocrines are indicated in some patients to enhance the condition of the gums as well as to improve the general well-being of the patient.

Prevention of dental calculus is effected thru periodic inspection of the oral cavity, cleansing of the teeth, the treatment of any gingivitis that may be present, and the feeding of a proper diet.

Dental care afforded canine patients by the veterinarian should be of such character as to relieve pain and inflammation, preserve the integrity of the teeth and their supporting structures and, so far as is possible, prevent the complications emanating from diseased teeth. The prevention and removal of dental calculus is an integral part of good dental care.

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